

Nitrogen Fertilizer Needs of Small Grains After Alfalfa

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Three main ideas



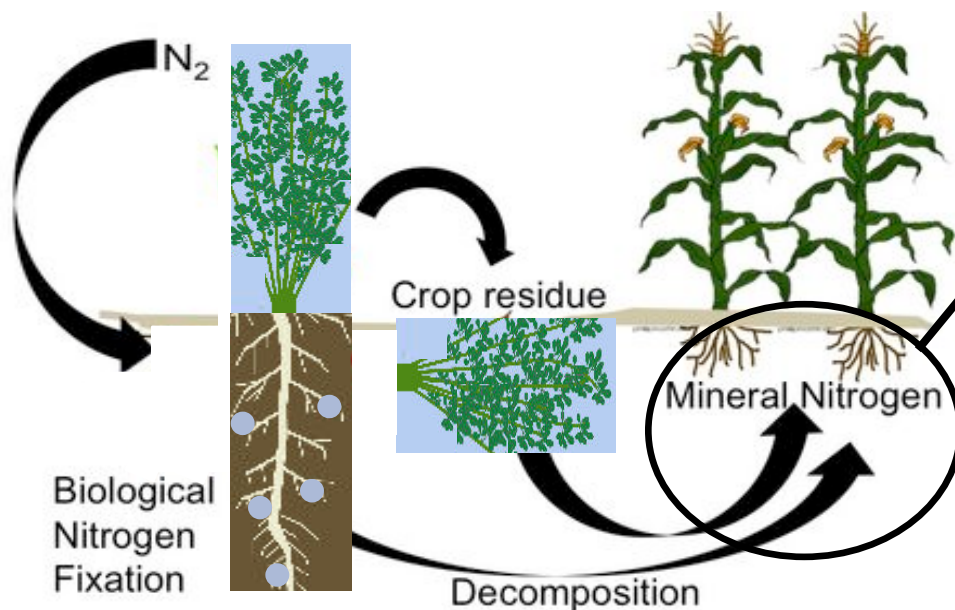
PREDICTION:

BAD ○

GOOD ○



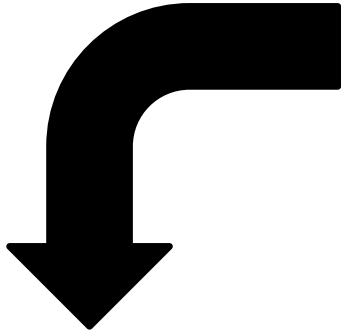
Alfalfa Nitrogen Credits



“N credit”

1. Alfalfa residue
2. N deposition
3. Soil quality improvements

Alfalfa



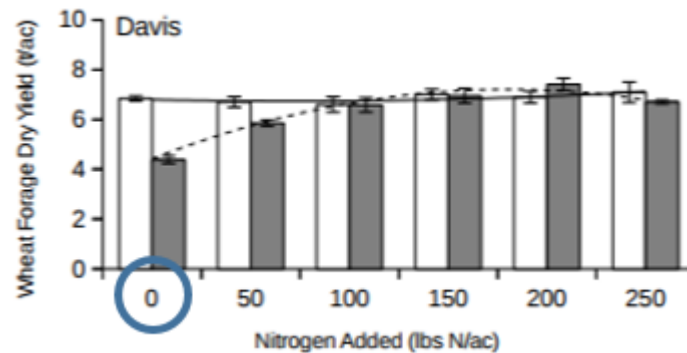
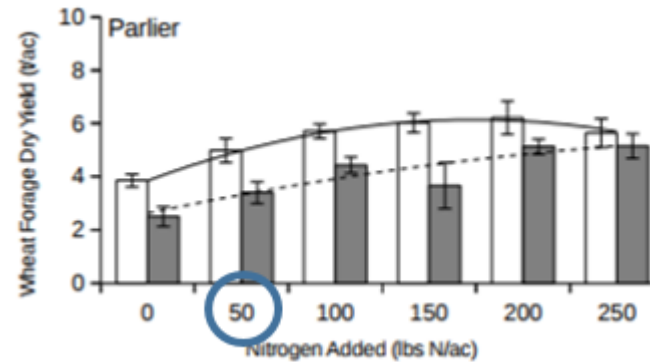
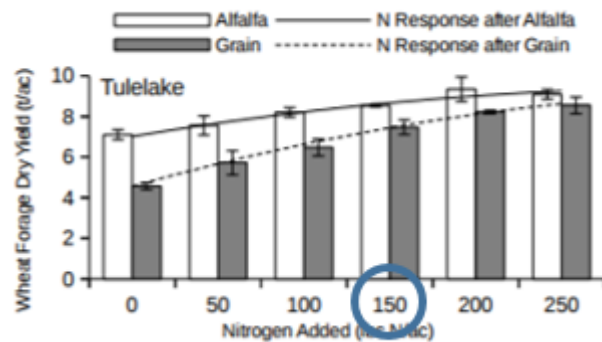
Corn



Small Grains



Literature

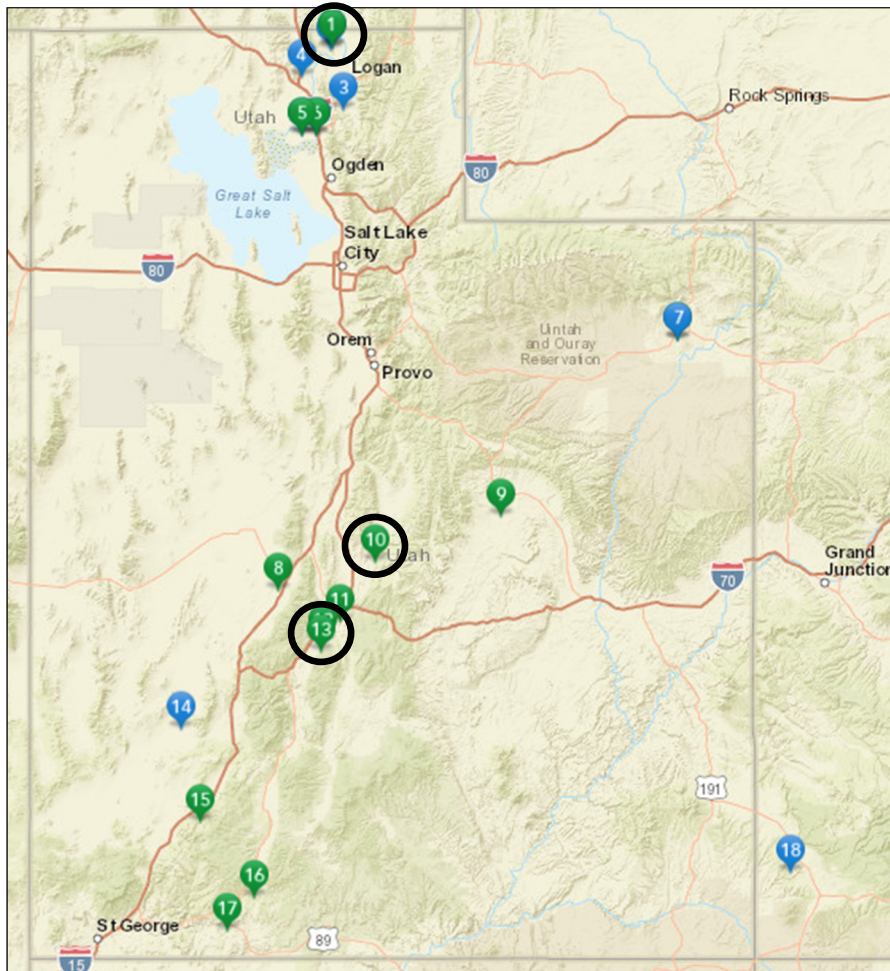


Literature



- 2001, Kelling and Speth, Wisconsin - 50 lb N ac⁻¹
- 1989, Badaruddin and Meyer, North Carolina - 130 lb N ac⁻¹
- 1987, Bulman and Smith, Eastern Canada - 90 lb N ac⁻¹

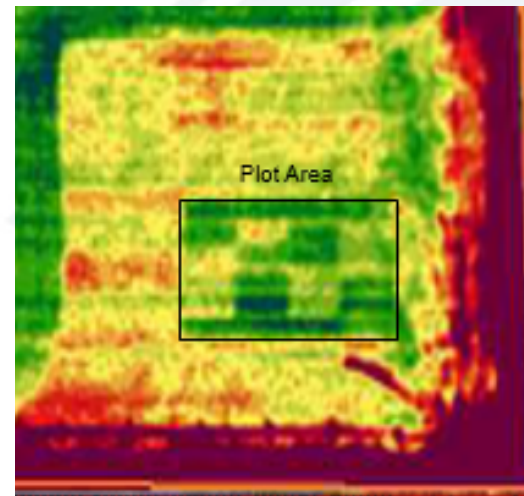
2018



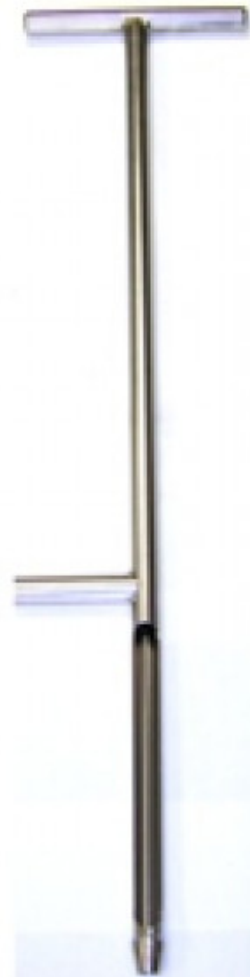
- 18 farms
- 13 forage - Green
- 9 grain - Blue
- Three 2nd year sites
- 15 1st year sites

Plot design

30	120	120	150
0	150	60	0
90	60	90	30
120	90	120	150
0	30	90	60
150	60	0	30



Soil Sampling



12 inch

6 inch

Fertilizer application

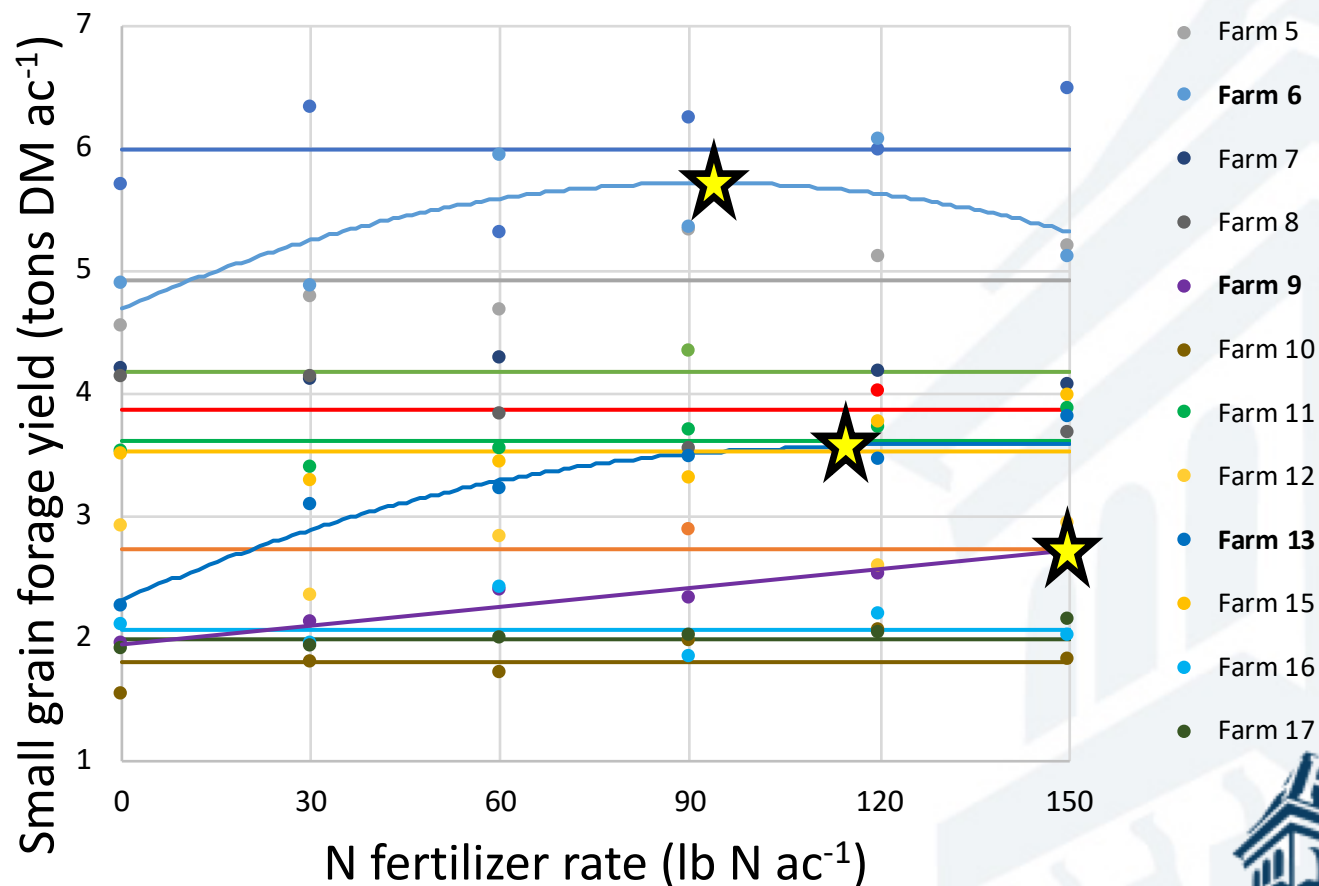


Harvest



Forage yield results

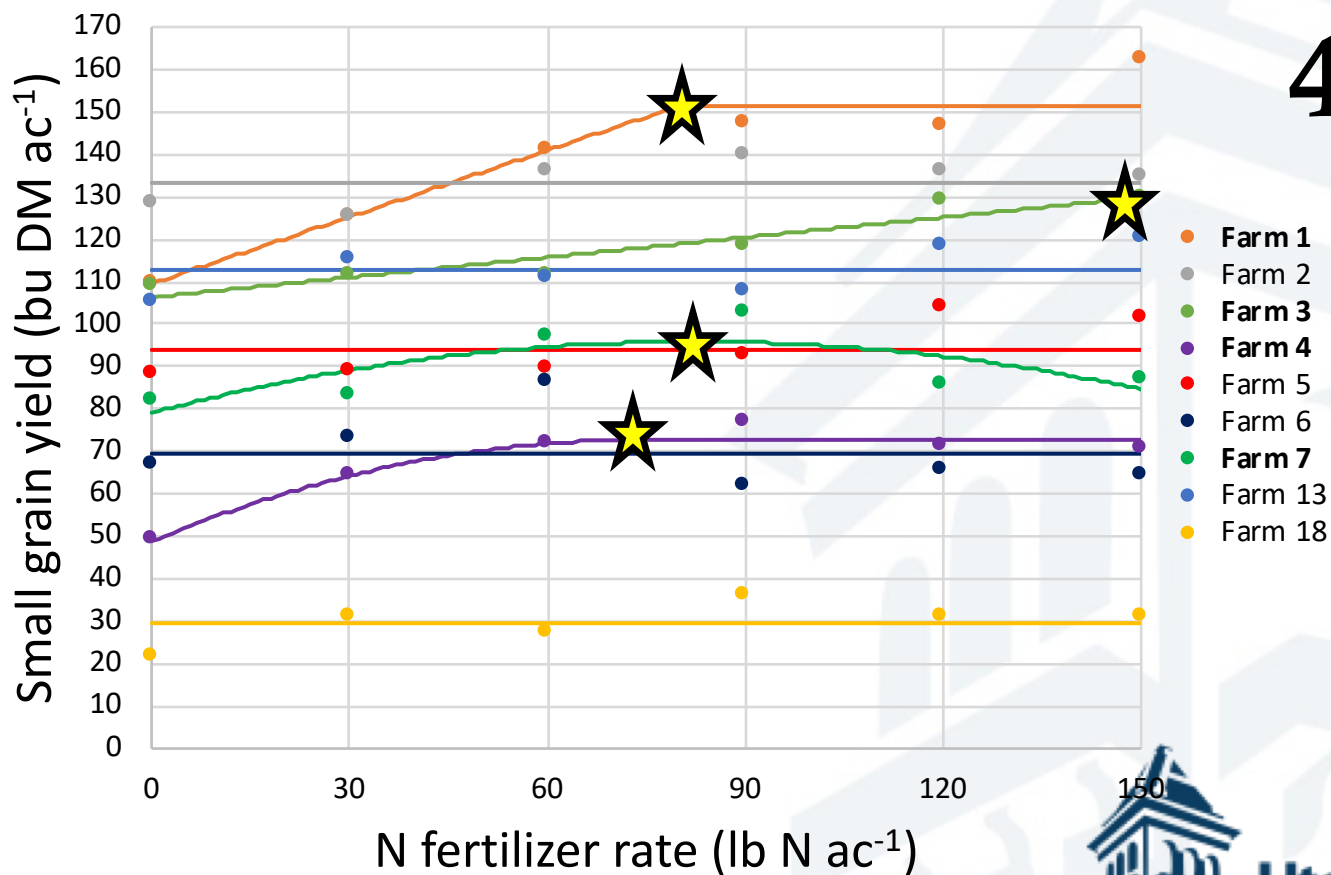
Forage yield



23%

Grain yield results

Grain Yield



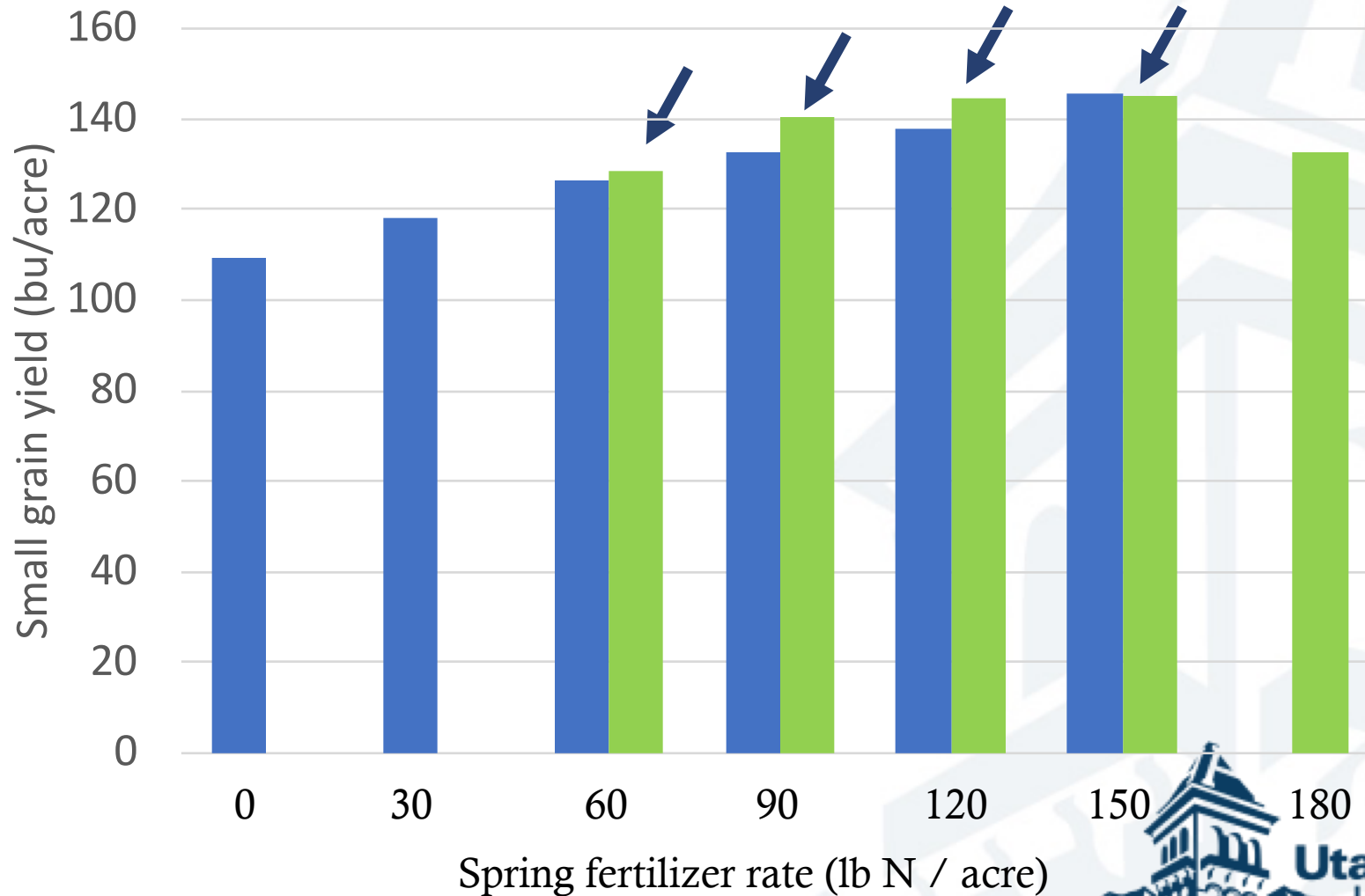
Application timing

Spring

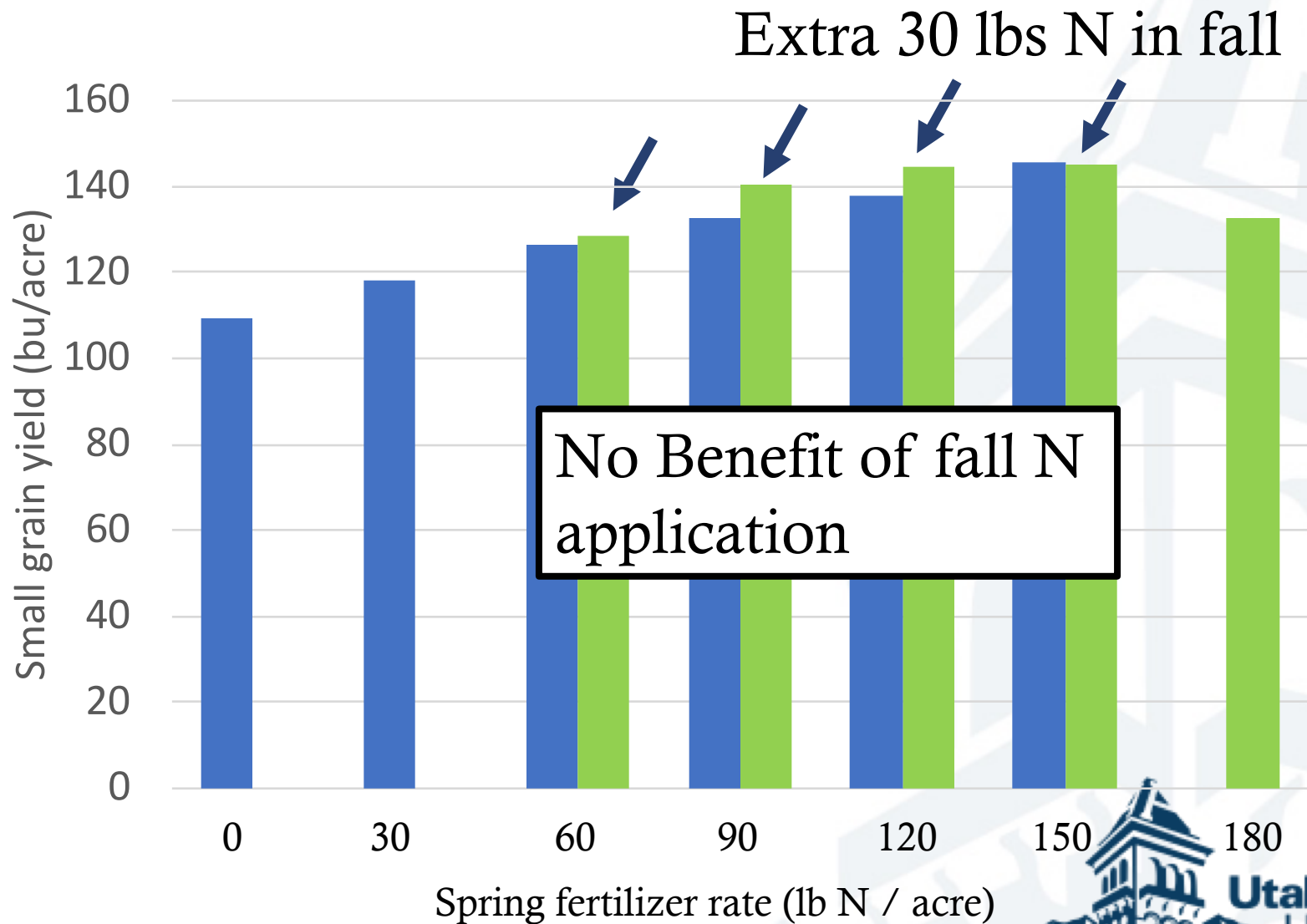


Is split N worth it?

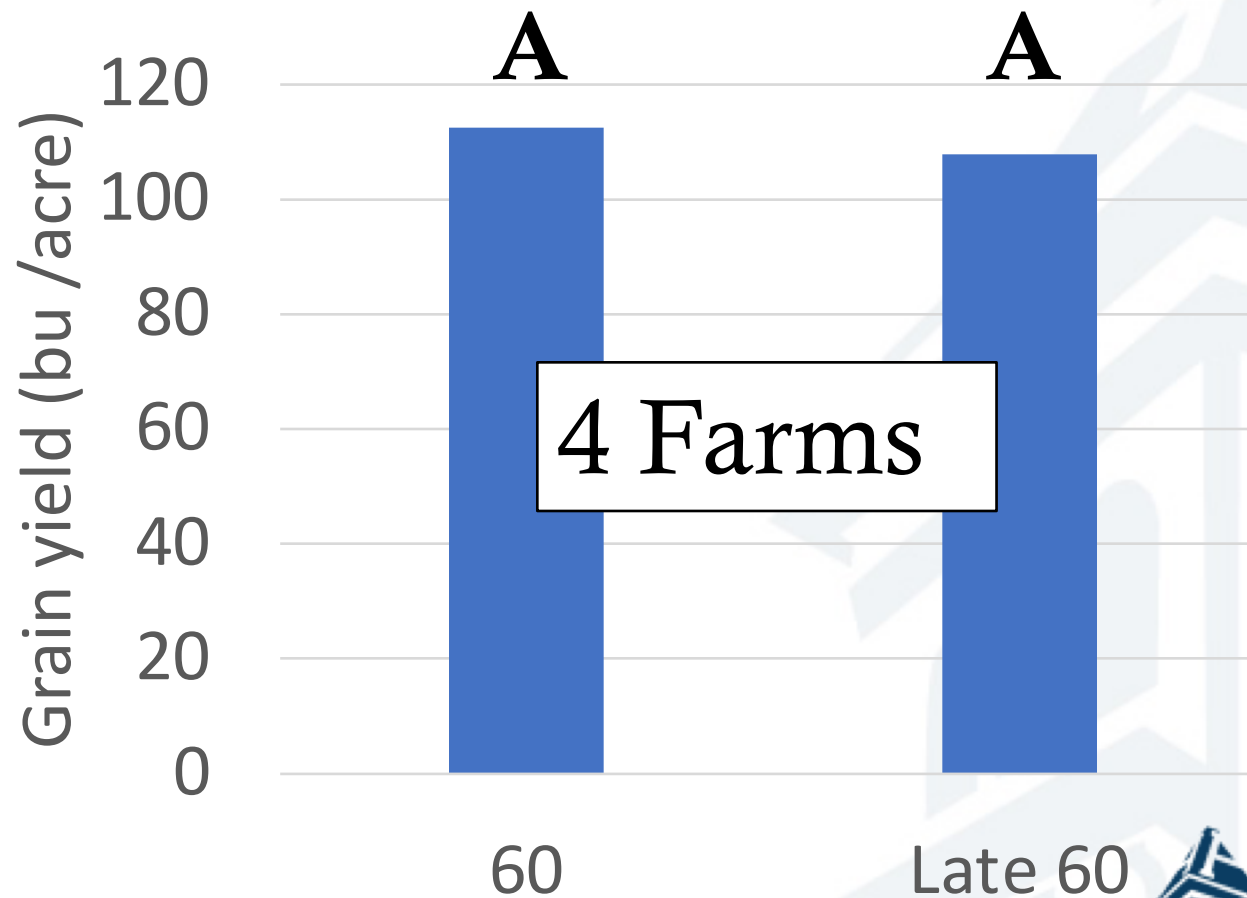
Extra 30 lbs N in fall



Is split N worth it?

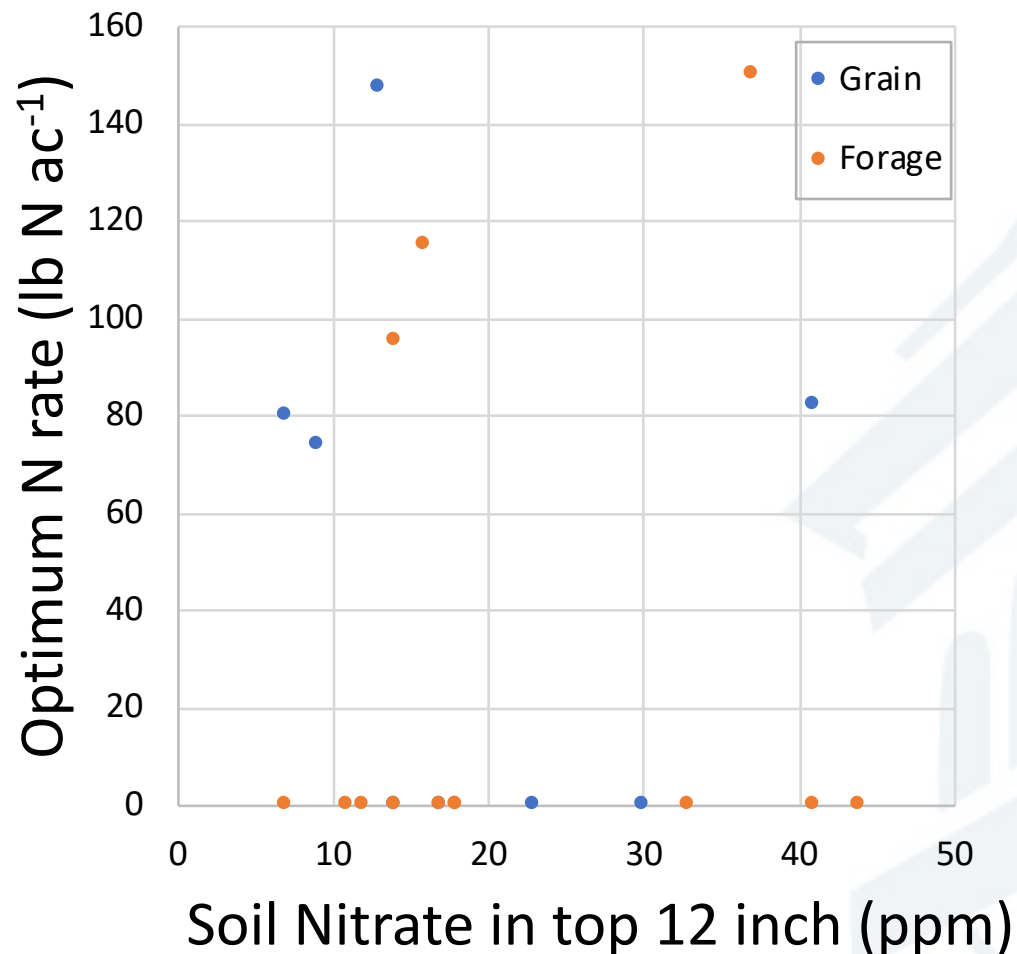


Is late N application beneficial?

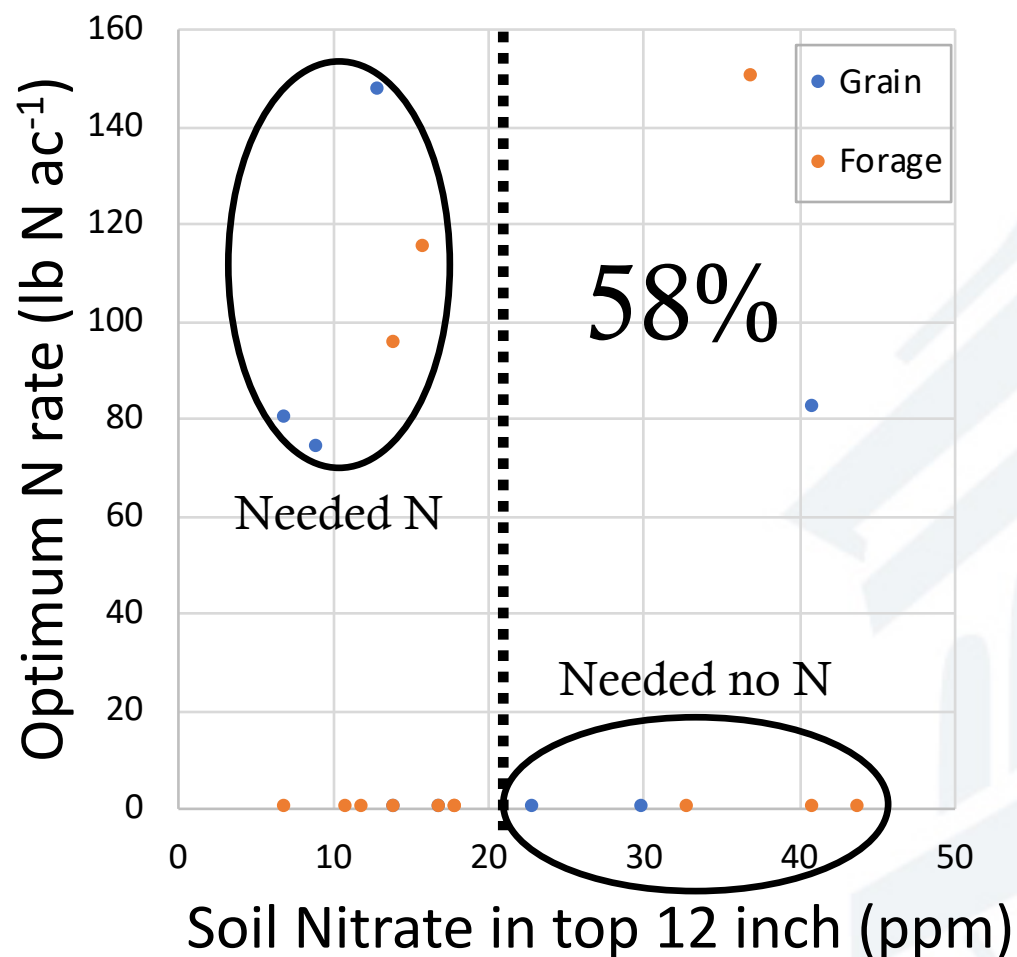


Predicting response to N

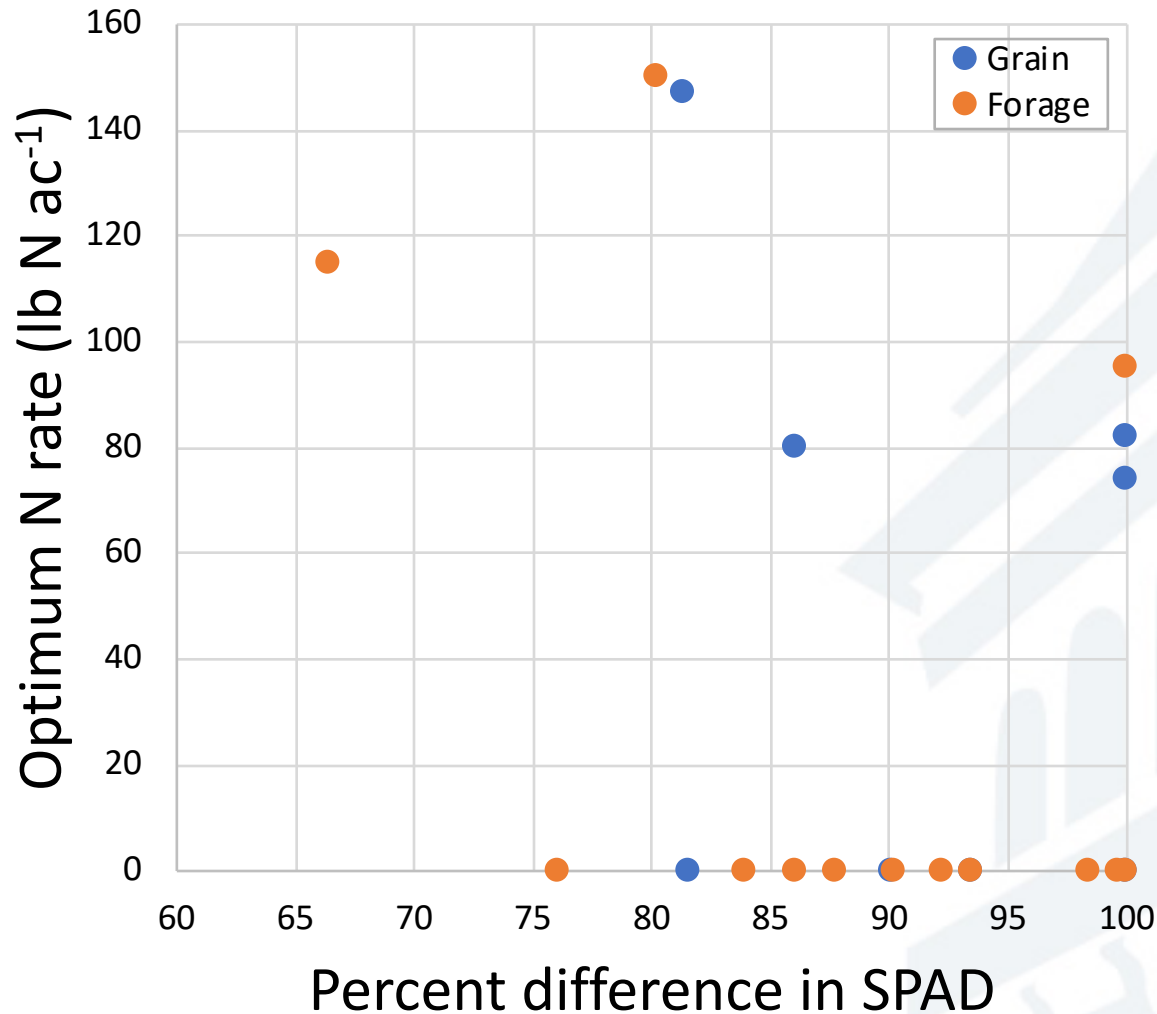
Soil nitrate levels (top 12 inch)



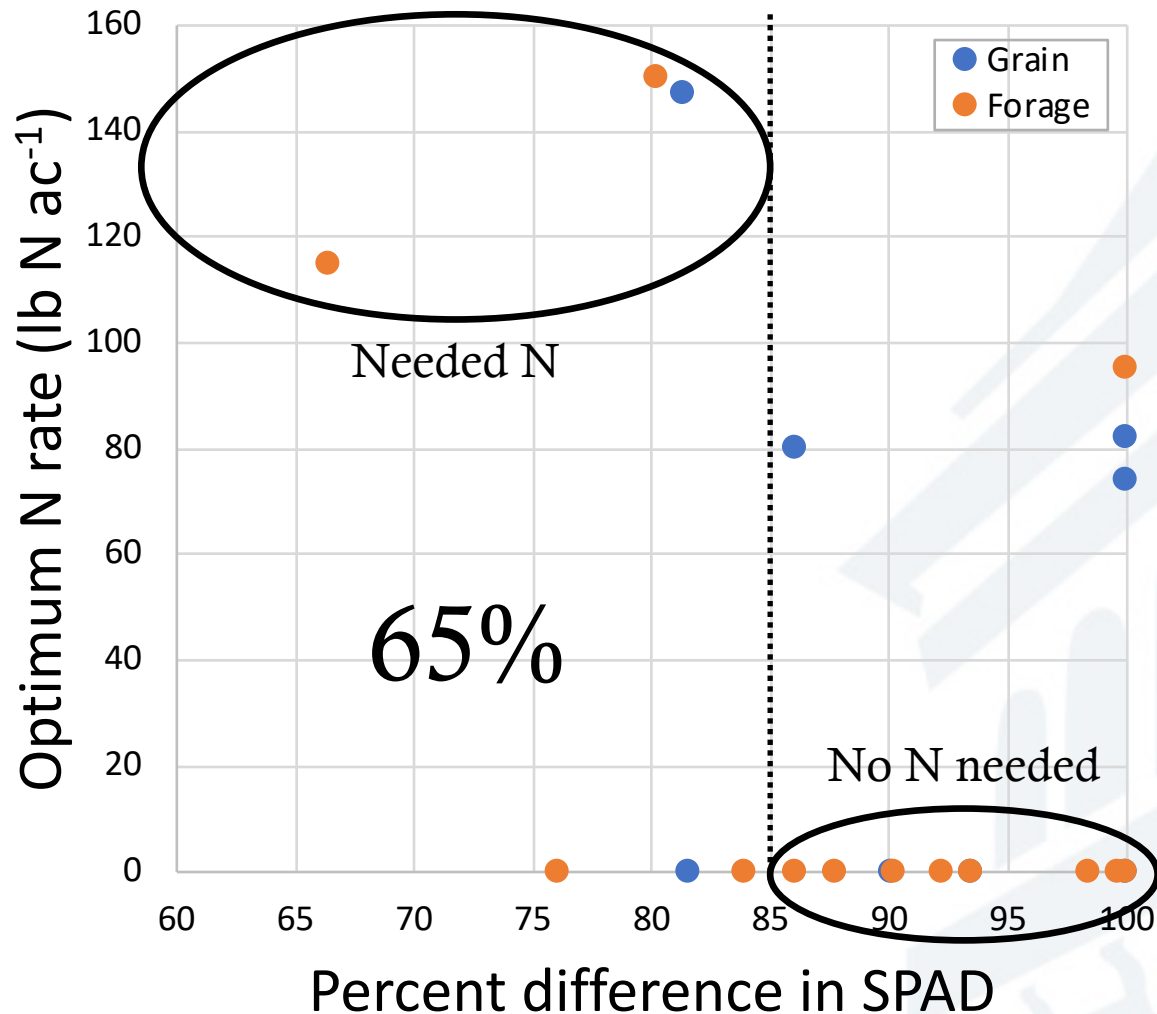
Soil nitrate levels (top 12 inch)



Leaf Chlorophyll data



Leaf Chlorophyll data



Preliminary Conculusions

1st year

~~Added
Nitrogen~~

Soil Nitrate
SPAD

Limited accuracy

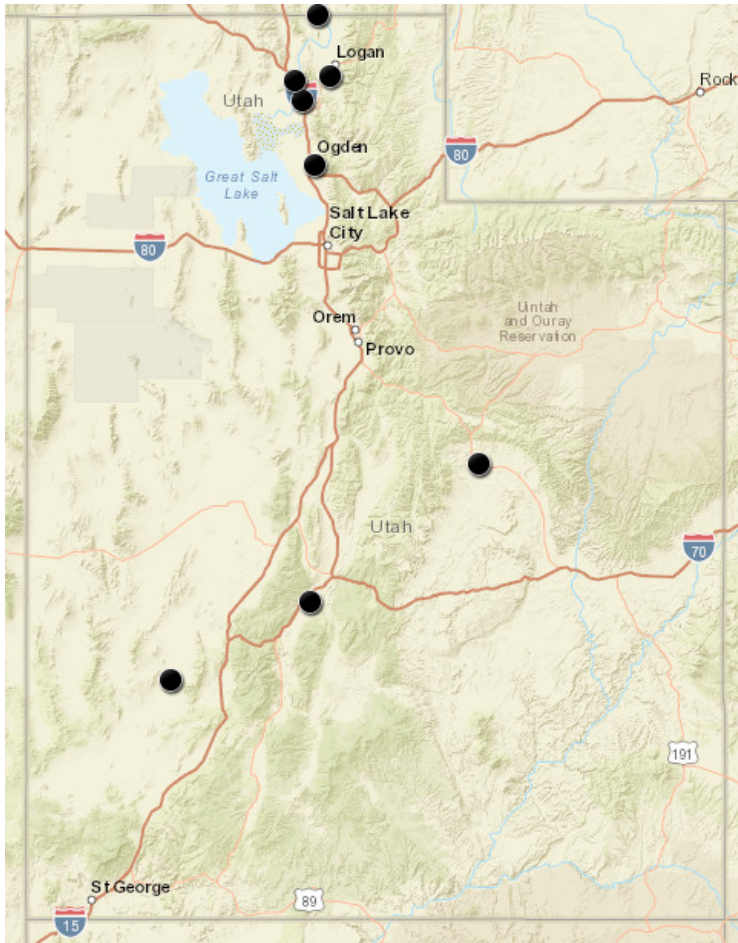
Additional analysis



Protein



Next step



- 15 fall sites set up for 2019
- At least 8 spring sites
- 2020

Thank you

Questions?

